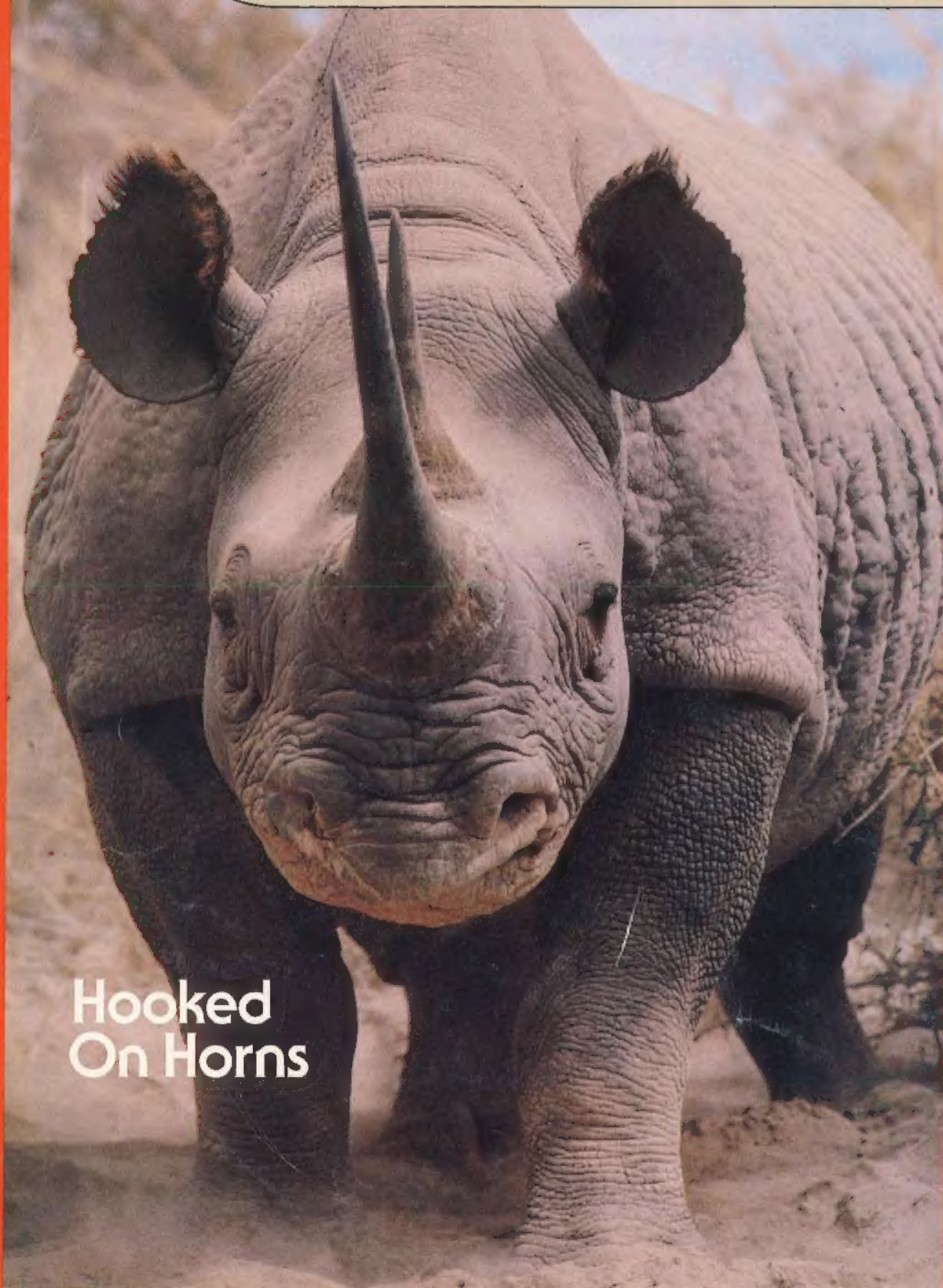
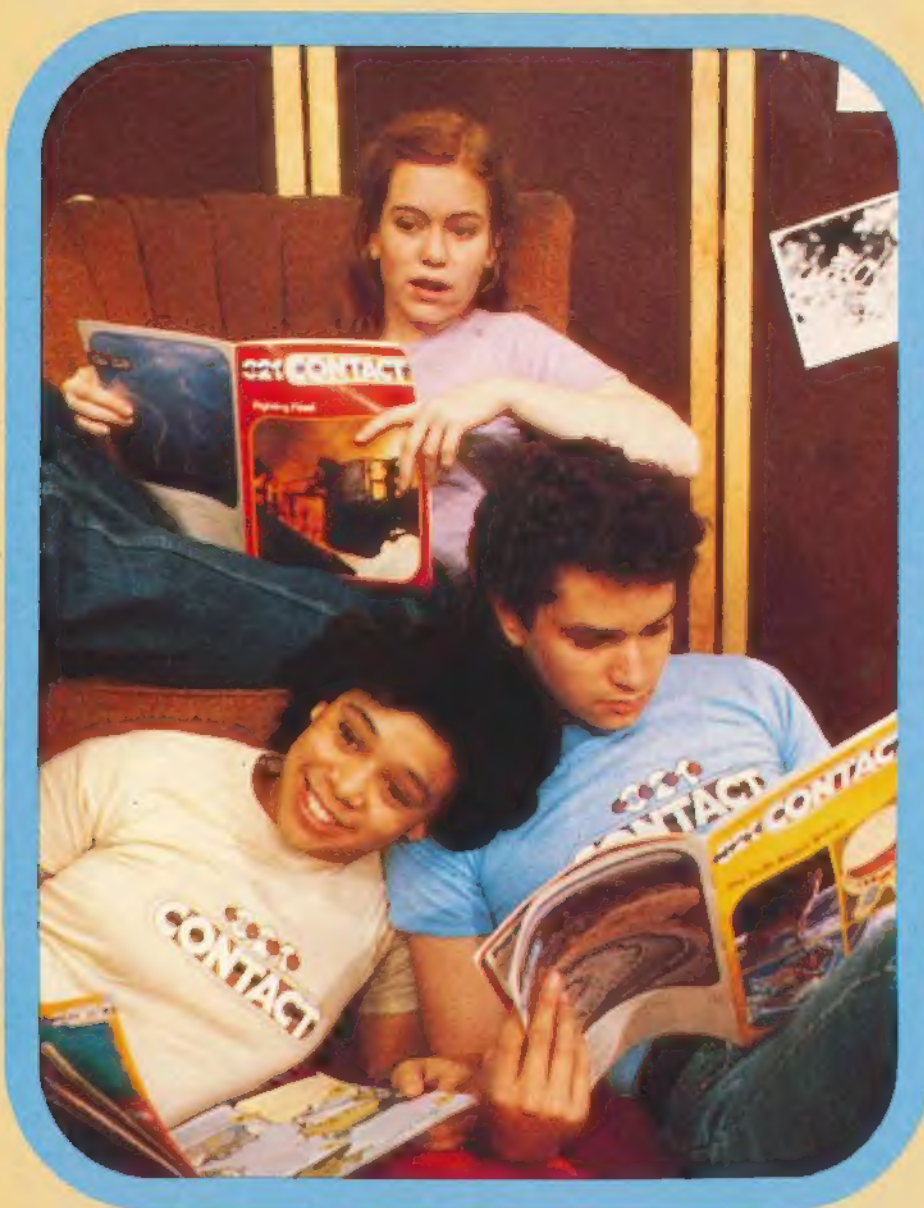


321 CONTACT



Hooked
On Horns



What's New?

You might also ask "who's new?" These kids aren't just any three readers of 3-2-1 CONTACT. They are Kathy, Robin and Miguel. This fall they'll be starring in a brand-new season of CONTACT television shows.

To find out when you can watch the new episodes, turn to the poster on page 20. And if you want to win your own CONTACT T-shirt, check out pages 19 and 36.

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Front Cover: This African rhinoceros has two horns—one behind the other. Most Asian rhinos have only one. Rhino horns are useful and dangerous weapons. They can grow to be over four feet (1.3 m) long!



Space Food

MEALS THAT ARE OUT OF THIS WORLD

by Cathi Rosenberg

Pretend for a minute you're an astronaut. You're traveling in space. Suddenly you feel hungry. You reach for a banana. It looks pretty weird to you. It's dried up. And it crumbles in your mouth. So you skip the banana and start to eat a piece of steak. But you forget one thing. There's no gravity in space. Before you know it, the steak escapes the package and starts floating away.

You're learning fast that eating in space is different from eating on earth. In fact, it could take an astronaut a few days to get the hang of it. If you would rather not ruin your first space flight by getting scrambled eggs stuck in your hair, you had better learn more about space food.

Food That Will Go Far

Space food doesn't come from a space food store. It is specially made for the Johnson Space Center in Houston, Texas. Two of the space food makers for the shuttle flights are Connie Stadler and Mike Fohey. It's their job to make sure all the space food is tasty, nutritious and easy to serve. It must be lightweight and take up as little room as possible.

"You can't have it exactly your way when it comes to eating in space," says Connie. "There are hamburgers, but no buns. There's no lettuce or pickles.

"But the astronauts have rye bread and peanut butter—so they can make sandwiches. They even put mayonnaise or mustard on them. We try to use as many foods as we can so that the astronauts won't get tired of them." So far Connie has used 70 different space foods and 20 space drinks.

Sounds great so far. But there's a catch. Many space foods must be freeze-dried. Freeze-dried foods have all the water taken out of them. They're the same kinds of foods campers use when they live in the woods.

When Connie and Mike freeze-dry space foods, first they cook them. Next is the freezing. The last step is putting them in a special machine to take out the water. That makes the food weigh less and take up a lot less room. Astronauts eat freeze-dried turkey, freeze-dried strawberries and even freeze-dried spaghetti!

For Connie, making up a space menu is like putting together a giant jigsaw puzzle. First, she decides which foods go in each meal. She has to make sure the astronauts get 3,000 calories a day and a well-balanced diet. In fact, they must have 20 different nutrients each day.

Then Mike puts the food in packages and weighs them. He's a food packaging expert. He knows how to pack everything as tightly as possible. For each astronaut, Mike is only allowed to send 3.4 pounds (1.5 kg) of food a day.

Cooking in Space

Once you're in space, you can't go out for a pizza if you burn your dinner. You have to get your act together when it comes to cooking.

Say it's almost time for dinner. You head for the space food closet. Take out a package of food marked Day 4, Meal C. That's dinner for the fourth day. Open it. You'll find tuna fish, macaroni and cheese, peas with butter sauce, chocolate pudding, peach ambrosia and lemonade.

You don't like something on the menu? Then you get a break. Go over to the space food pantry. There are plenty of substitutes. If you don't like the meat, you can choose another kind. Codes will help you tell beef from broccoli.

Now look for a machine with lots of doors and drawers. That's the food warmer. It's called the galley. Attach your plastic food packet to the devices you see on the outside. They will add water to your macaroni, peas, ambrosia and lemonade. The water helps to return the food to the way it was before it was freeze-dried.

Now you're ready to put some of your dinner inside the galley to warm up for 30 minutes. Almost ready to eat now? Pull the flip top on the chocolate pudding can. Open the tuna in its pouch. Attach all the food packages to the space food tray. Now take off the lids and dig in!

Floating Food

Wait! Don't dig in too fast! You're in space where there's no gravity. So eating can be tricky!

If you have a big mouth, it might come in handy. "When you take a spoonful of food, it doesn't just stay on top of the spoon," says Mike. "It clings all around, sort of like a lollipop."

You have to learn how to eat in slow motion. Say you want to eat more cereal quickly. The spoon will go right into your mouth. But the food stays behind and floats in the air. Don't make fast uneven movements or you'll never get space food into your mouth!

Slick Tricks With Space Food

Once the astronauts get the hang of eating in

Below: Shuttle astronauts have a choice of 70 foods and 20 kinds of drinks. In this meal there are turkey, mixed vegetables, mushroom soup, strawberries, butterscotch pudding and fruit punch.





Above: You don't need a glass to drink orange juice in space. That orange ball is liquid juice floating in the shuttle. Liquids that float in space always form into balls. So, all the astronaut has to do for a drink is stick in his straw!

space, there are some neat tricks they can do. On the Skylab flights, they let their food float right in front of them. First, the astronauts clamped their meal trays down. Then they cut up pieces of steak and let them drift away. If the steak started floating too far away, it was no big deal. Everything floats gently. The astronauts simply grabbed it out of the air.

On one shuttle flight, astronaut Joe Allen played a trick with orange drink. He knew that if you let liquid float freely in space, it forms a perfect sphere. So he poured out some orange drink. Then he put a straw in his mouth and held it up to the floating ball of drink. Sucking it in, he watched the ball get smaller and smaller... until he swallowed the whole thing!

Space Food of the Future

What will space food be like when it's your turn to take a trip in space? No one knows for sure. There might be space stations in the sky where you would live for months on frozen TV dinners. Or you might start seeds and grow your food right on the spacecraft.

For now, all you can do is watch space movies at your local theater and dream of a future trip. But while watching space movies on earth, at least you don't have to eat freeze-dried popcorn!

Right: First water is added to the freeze-dried food. Next the astronaut heats his food in this warmer for 30 minutes. Then he is ready for a hot dinner in space.



Factoids



There are 70 museums across the United States that were built especially for kids.



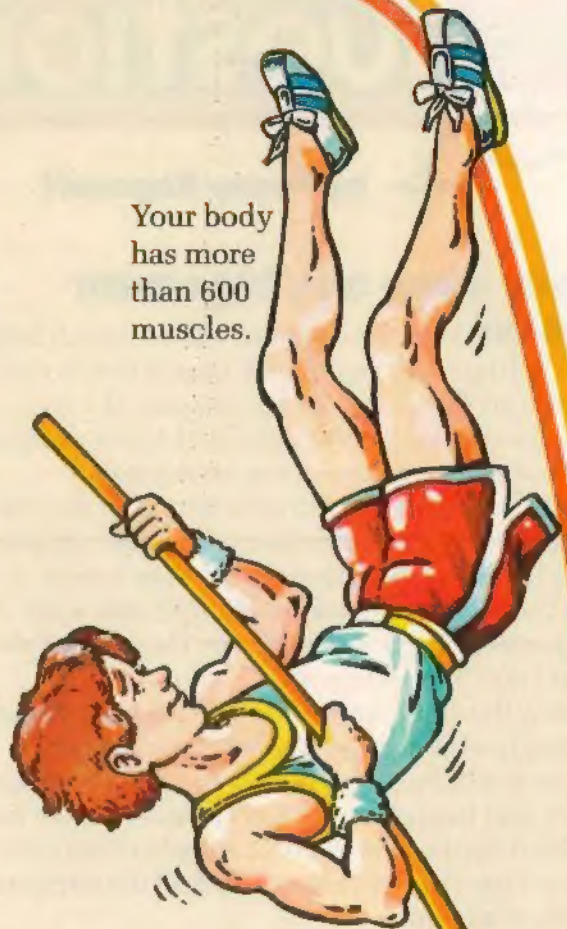
The largest bubble gum bubble ever was blown by Susan Montgomery. It measured 19 $\frac{1}{4}$ inches across.



On the average, three million Americans go to the movies each day.



The largest watermelon on record weighed 200 pounds. It was grown in Hope, Arkansas, in 1980.



Your body has more than 600 muscles.

There is more aluminum in the earth's crust than any other metal.



Unlike the dogs you know, the Australian wild dog, the dingo, can't bark.

Any Questions?

by Penny Kaganoff

How does a refrigerator work?

For a clue to your answer, reach behind your refrigerator. Feel the air near the coils there. It's warm! Those warm coils are part of a cycle. This process takes heat right out of your refrigerator and everything in there, too. Here's how:

Orange juice and milk aren't the only liquids in your fridge. There's another one called *refrigerant*. This liquid travels through the pipes inside. At one point along the way, it changes into a gas. As it evaporates, it absorbs heat from the food inside. That cools everything off.

Now the cycle continues. The gas goes through more pipes to another part of the refrigerator. There it will be changed back to a liquid refrigerant. After that happens it is ready to absorb more heat.

What happens to the heat already collected? That is passed right out the back of the refrigerator! Pretty cool, huh?

Question sent in by Sarah Hauschild, Tacoma, WA.



What are fingernails made of?

Your nails are hard and tough. They have to be to protect your fingers and toes. What makes them so tough? The same material found in animal claws, hooves, horns and beaks! It's something called *keratin* (KER-uh-tin).

Hidden below each of your nails is its root. The cells in the root give off keratin all the time. The keratin collects and pushes up old keratin that is in the way. As it does, the stuff dries and hardens into a solid plate. Your nails are growing!

Your nails grow all the time. A typical fingernail will grow about a sixth of an inch (.4 cm) in a month. Over a lifetime, that can really add up. Shridar Chillal is living proof of that. He hasn't cut his nails in the last 29 years. His thumbnail alone is over 27 inches (68.6 cm) long!

Question sent in by Gena Beevers, Magnolia, AR.



Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

What is petrified wood? When a tree dies, it usually decays and disappears. Under special circumstances, a dead tree turns into stone instead. But that takes a very, very long time.

Wood starts to petrify when it is buried in the sand, mud or ash from a volcano. In the same area, the water in the ground must be rich in minerals. This water seeps down and reaches the tree.

Minerals from the water begin to fill the empty cells in the decaying wood. Layers of minerals collect there. But the rest of the water continues to sink deeper into the ground. More and more dried-up minerals build up. Finally, they become solid stone.

Petrified wood is a kind of fossil. Like most fossils, it is very old. Some of the wood in Arizona's Petrified Forest National Park is 150 million years old.

Question sent in by Carrie Osborne, Mesa, AZ.



Can you tell how old a rattlesnake is by counting the beads on its rattle?

Who wants to get close enough to find out! Actually, a snake's rattle is a clue to its age. A young snake starts out with one bead on its rattle. As the snake grows, it sheds its skin. Everytime this happens, a new bead is added to the rattle.

You can't use the beads to tell the exact age, however. For one thing, a snake sheds its skin three or four times a year. It all depends on how fast it's growing. If that weren't confusing enough, there is the old age problem. After a few years, a rattler's beads start to get old and brittle. Some of them fall off.

So, a snake's rattle can only tell you two things for sure. The first is that the snake is a rattler. And the second? Stay clear!

Question sent in by Martin Meyer, Bloomington, IN.



HORNS & ANTLEERS

AMAZING ANIMAL HEADGEAR

by Renee Skelton



Some curve into circles. Others twist, turn and spiral. They can look like the bare branches of a tree. Or like huge, silly-looking coatracks. Some of them are as tiny as your finger. But others are bigger than you. If you haven't already guessed what we're talking about, it's animal antlers and horns.

Antlers and horns might seem like the same things, but they're not. Only members of the deer family—like moose, elk, and reindeer—have antlers. Lots of other animals—like goats, buffalo, even giraffes—have horns.

Horns and antlers are different in a few ways. First, they are made of different things. Antlers are made of bone. All through the summer they are covered with soft skin called velvet. Horns sometimes are hollow. And sometimes they have a core of bone. But they are mostly made of keratin. That's the same stuff that's in a cat's claws, a bird's beak and your fingernails.

Another difference is that animals with horns keep them all year round. The horns just grow bigger every year. For most deer though, antlers grow for about five months in summer. In early fall, they stop growing. Then in late fall or early winter they drop off. But each spring, the deer grows a new set of antlers—bigger and better than the set it lost the year before.

So why do animals carry around all this headgear? For fighting. Usually, only males have antlers and horns. During mating season, they use them in contests with each other. The winners get to mate with the females. Antlers and horns are also used for protection. They are the only way most of these animals have to defend themselves.

So, you can see that for many animals, it's what's up front that counts. For more of the story on some antlers and horns, have a look at the next few pages.

Fallow Deer

If you could get close enough to touch the antlers of these fallow deer, they would feel warm. The heat is from blood that flows under their layer of velvet. The blood nourishes the antlers while they grow. At summer's end, the antlers stop growing and the velvet dries. Then the deer remove the velvet by rubbing their antlers on bushes and trees.

Bighorn Sheep

The horns of this bighorn sheep can tell you some things about it. The nicks and broken ends tell you he's been in lots of fights. But the horns can also tell you the sheep's age. Look at the horn on the right. Each year's growth is separated from the rest by a deep, dark crease. So count the sections and that's how old the sheep is.



Moose

The moose's spectacular antlers are the biggest of all. And they are very special. No two sets of moose antlers are exactly alike. Like other deer, moose shed their antlers each year. When they are young, each set is small. But by age six, a moose can grow antlers that are six feet (1.8 m) across—and weigh up to 85 pounds (39 kg).





Elk

Like all deer, these elk will usually fight with their antlers in the fall. By then the antlers have stopped growing. They have become hard and tough. In summer while still growing, antlers are pretty flexible. Knocking them against things could bend them out of shape. So how do elk fight in summer? By standing on hind legs and boxing with their front feet!

Oryx

Most of the time, only males grow horns. But not the oryx (OR-iks). Both males and females have them. Like all animals, this baby oryx had no horns when it was born.

But it's already starting to grow a set. By the time it's full-grown, its horns will be about four feet (1.2 m) long!



Musk Ox

The big, shaggy musk ox has a special way to protect itself when danger is near. All the oxen in a herd form a circle. They stand shoulder to shoulder—with their sharp, curved horns pointing out. It's a warning to any animal to stay away.



Kudu

Kudus have some of the most unusual horns. They also have some of the largest. A full-grown kudu can grow a set five feet (1.5 m) high. Kudus sometimes use their horns for fighting. But these animals are such good runners and jumpers that they can easily get away from danger.



List of the Month Hooray for Horns

by Joanna Foley

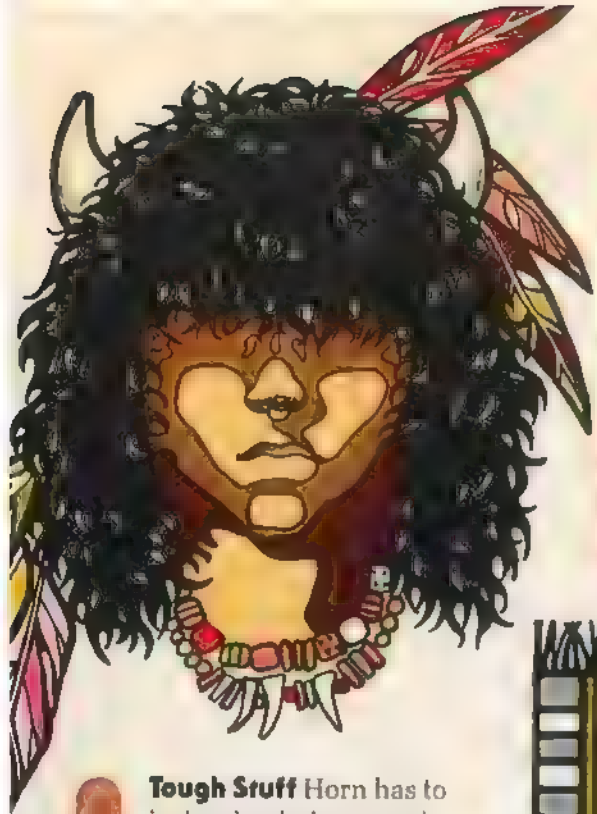
Many animals can hardly do without horns. Did you know people find horns handy, too? Keep reading.

Horn Hats A cow has a built-in headdress—her horns. People sometimes put horns on their heads, too. Remember the Vikings? These adventurers wore headgear made of horns. For hunting ceremonies, the Mandan Indians made headdresses out of buffalo horns. As they danced around a fire, hunters wore these horns to bring good luck in finding buffalo.

Blow Your Horn Did you ever toot a trumpet or blast on a bugle? Then you were playing a musical instrument called a horn. Long ago, instruments were actually made from animal horns. A hollowed ram's horn was blown to call people to religious celebrations. Other people believed that sounding a horn could drive out demons.

Horn Windows You think of horns as very solid. But horn can be cut into layers. Then you can actually see through it. And that's just what people used to do in colonial America. In their homes, windows were made of thin sheets of horn. Glass windows were rare and expensive. So when people built a window, they put up a sheet of horn instead of a pane of glass!

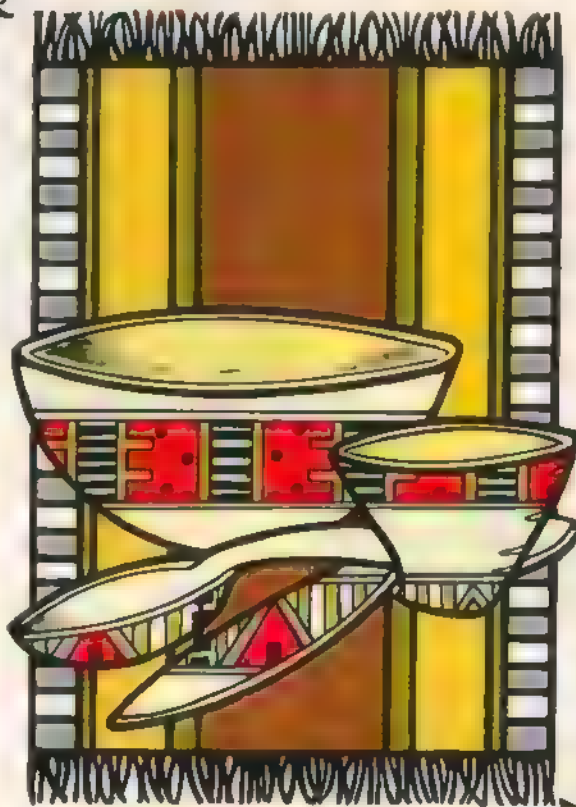
Poison Detector Drinking cups were often made from a hollowed out horn. But the strangest horn cup of all did more than just hold a person's water or wine. Believe it or not, this cup served as a poison detector! Long ago, a ruler would have a cup made out of rhinoceros horn. In that kind of cup, if a drink had been poisoned, it would turn milky looking. The poison would dissolve a tiny bit of the cup!



Tough Snuff Horn has to be hard to help animals defend themselves. But tough as it is, people manage to carve horn into many different things. In Africa, rhinoceros horns were carved to create small sculptures. Rhino horns were also split to make handles for daggers, then carved and decorated. Horn daggers were a sign of wealth since they were very expensive.

Hornrimmed Glasses

Horns used to go from animals' heads to people's heads—as frames for glasses. Polished horns were shaped into brown frames. They were called —what else— hornrimmed glasses! Horn was also made into buttons for clothes. And don't forget another use for polished horn. It can be made into a shoehorn to help your feet slip into new shoes!



Dea Dea Dig Sheep

What's a big horn useful for? To some American Indians, it was great for making a big bowl. They hunted bighorn sheep. These animals' huge horns were softened in a fire. Softened horns were shaped between rocks, then carved and polished. After all that work, people had a large lovely bowl. Any leftover horn became spoons for soup!



Pow Pow Powder

Gunpowder was used long ago to load the muzzles of guns. People needed a container that was safe and handy to use. That's where the horn of an ox came in. The horn's large end was packed with powder. When you loaded a gun, you removed the cap on the small end. The gunpowder could be funnelled into the gun without spilling a bit.



Contact Report

A New Black Hole You may hear a lot about black holes out in space. But so far, they seem pretty rare. So people got really excited this year when a new one was discovered. It is only the second black hole ever found.

This black hole is named LMC-X3. That's short for Large Magellanic Cloud, X-ray Source 3. The Large Magellanic Cloud is the galaxy closest to our own, the Milky Way.

The new black hole was discovered by Ann Cowley, David Crampton and John Hutchings. But it wasn't easy for them to find. Black holes are dying stars. Their gravity is so strong that nothing can get out, not even light. The astronomers found a region in space that was giving off lots of radiation. Large amounts of radiation often pinpoint the location of a large star.

But according to Ann, their telescope shows instead that "we see nothing like a large star. That's why we know it's a black hole."

—Written by Alijandra Mogilner



A new black hole was found in this nearby galaxy.



Special glasses help blind people get around.

Ear Glasses Eye glasses that provide sound instead of sight? That's right. SonicGuide is a pair of glasses that helps blind people to "see" using sound.

The sound spectacles were invented by Derek Rowell and Leslie Kaye. They wanted to help people get around the way bats do. Bats use sonar, or sound navigation.

A SonicGuide sends out high-pitched sounds that even the wearer can't hear. When the sound waves hit whatever is nearby, they bounce back. These echoes reach the SonicGuide's earphones. There, they get changed into regular noises.

A blind person can tell what he's "seeing" from whether the noise is loud or soft, high or low, says one wearer. "It's almost like being able to see," says Caroline Forsberg, "but it doesn't tell you the finer details." SonicGuide lets her ride horses and bikes without help. And in winter, she can go out and "hear" snowflakes all around her!

—Written by Alan Darling

Contact Report

Hospital for Seals People sometimes go to a hospital and so do pets. But seals and sea lions? Now there's a hospital for them, too.

The California Marine Mammal Center is for sea mammals that wash up on shore near San Francisco. Some of them have been hit by boats or bitten by sharks. Others land on a beach because they are sick and exhausted.

"They seem to have given up on themselves," says Tina Papenhouse. She is a volunteer at the center. She works with other volunteers and scientists to rescue these big animals.

One rescue squad saved a fur seal, an animal rarely seen in California. Delta Joy, the seal, was picked up in a van. At the center, she was given antibiotics for her cold and plenty of raw fish to eat. When she was well enough, Delta Joy was put back in the sea. "Once we return our animals to water," Tina says, "they don't look back."

—Written by Fred Gebhart



Now seals and sea lions have a hospital.

Lawnmobile Grass usually grows on the ground, right? Well, thanks to Bill Harding, it now grows on other things—like clothes and cars!

Bill started growing grass in strange places last year. He made a grass suit to wear as a joke. It was such a hit, Bill decided to try it on something bigger. The result was the world's first grass-covered car.

Bill says covering a car with grass was pretty easy. First he applied a sticky chemical. Then he put on grass seeds and topped them with plastic. Finally, he watered the seeds each day. After two weeks, he had the first lawnmobile. The only thing Bill hasn't figured out is, how do you mow the grass?

—Written by Joanna Harrael

What's That? Have you read about a kid who invented something new? Or one who set a new science record? Then cut out the story and send it to us. If we use it you'll get a CONTACT T-shirt. Include your name, address, T-shirt size and the newspaper or magazine the story came from. Write to: **The CONTACT Report**

P.O. Box 599
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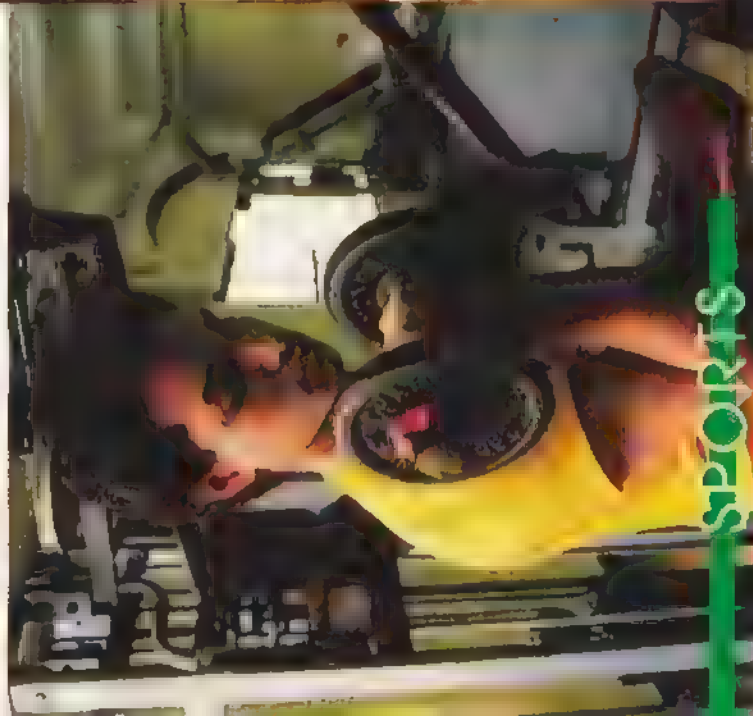


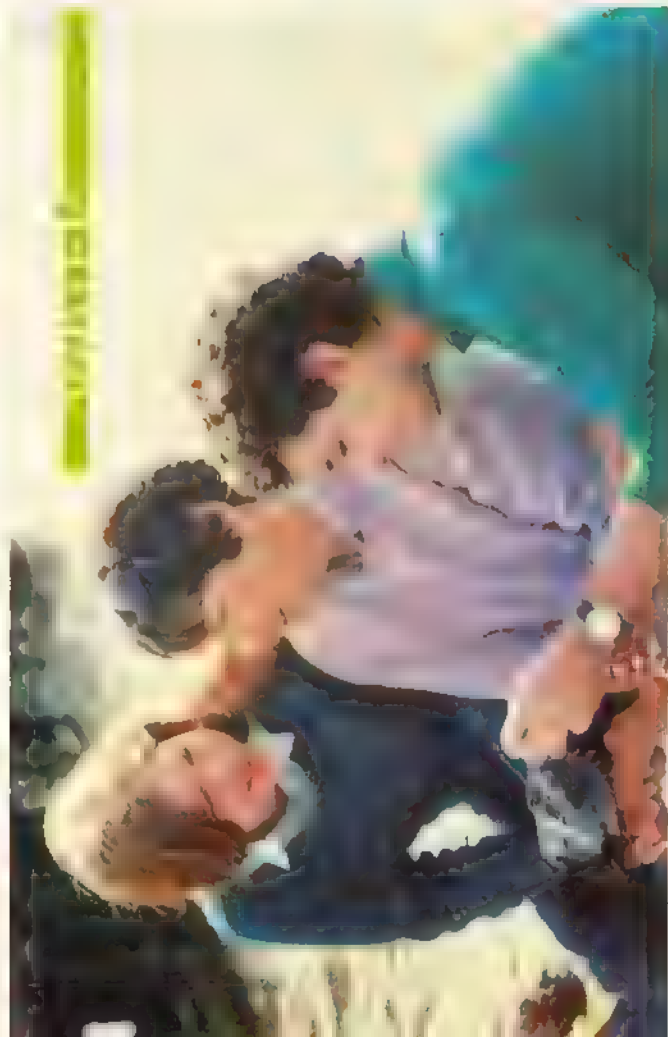
After awhile, Bill's suit starts to grow on you.

3-2-1 CONTACT

RETURNS

On October 17th, a brand-new television season of 3-2-1 CONTACT begins. Follow the adventures of Kathy, Miguel and Robin as they explore the world of science. What time will 3-2-1 CONTACT be on where you live? Check your local TV listings to find out.





What's Popping?



Imagine
sinking your teeth
into strawberry or
hot dog-flavored popcorn!

NEW TRICKS WITH AN OLD TREAT

By Sandra Markle

Popcorn is a subject you can really sink your teeth into. And what better time than October? All over the country, people are harvesting this special kind of corn. Chances are that by Halloween you will be munching on some popcorn yourself. But why wait until you are out trick-or-treating? Things can start popping right now!

Tutti-Frutti!

All popcorn tastes pretty much the same, right? If you think so, try a little watermelon-flavored popcorn. Or pizza popcorn. Or tutti-frutti! These are a few of the wild new flavors ready to tickle your taste buds. By adding artificial flavors, people can make popcorn taste like just about anything. There's even a flavor called ballpark. Take a bite and you would swear you were eating a hot dog.

So far there are about 30 different flavors of

popcorn. You probably won't find them at your local movie theater or supermarket. They are mostly sold in special new popcorn shops. These stores are popping up everywhere.

What Puts the Pop in Popcorn?

Popping corn is different from regular corn. In the middle of each kernel is a little extra moisture. That's what makes a kernel a top popper.

As you heat a popcorn kernel, the water inside heats, too. Soon the moisture in the starchy center turns to steam. At first the hard coat on the corn holds in the expanding steam. But suddenly, POW! The popcorn kernels burst open and turn inside out. The starchy center is now steam cooked and ready to eat!

How to Save Pooped Popcorn

Next time you make a batch of fresh popcorn,

take a look in the bottom of the bowl. Are there a lot of unpopped kernels left? Uh oh! These duds are a sure sign of tired popcorn. But don't worry. There's a simple trick to save old, dried-out kernels. It will help bring stale kernels back to life.

Put your popcorn in a quart jar. Fill the jar near the top. Add two tablespoons of water. Now cover the jar tightly and shake it. Let the covered jar stand overnight. The popcorn kernels will absorb the water. Their starchy centers will become nice and moist. The next batch of popcorn you make should really pop!

Popcorn Plus Peanut Butter

What do you add to popcorn? Some people add melted butter or salt. But if you serve it plain, it's better for you. One cup of freshly popped corn has only about 40 calories. That's

less than you would get in two chocolate chip cookies. Corn is high in fiber and contains no sugar. It also has more protein than an equal amount of potato chips, ice cream or pretzels.

Still want some added flavor? Then why not stir up some on your own. Here are two recipes to get you started. For each one, start with four quarts of popped corn.

Sesame, Raisin and Coconut Corn: Mix together two tablespoons of sesame seeds, $\frac{1}{2}$ cup of raisins and 1 cup of shredded coconut. Add to a batch of popcorn and stir well.

Peanut Butter and Honey Corn: Melt two tablespoons of butter or margarine. Add two tablespoons each of peanut butter and honey. Stir over low heat until the mixture is runny. Then pour over your popcorn and mix until ►



all the kernels are coated.

The World's Biggest Popcorn

Can you imagine sinking your teeth into a piece of popcorn about the size of a grapefruit? That's what a popped kernel looks like from a kind of popcorn called Billion Dollar Baby. It measures 14.5 inches (37 cm) around the middle! This is just one of thousands of different kinds of popcorn that plant breeders have developed.

If you were to walk into a popcorn field in the Midwest, you would see how these scientists do their work. Rows of short corn stretch across the flat land. Each plant has a tassel on top of its stalk. That's the male part of the plant. Each plant also has strands of silk attached to the corn cobs. That's the female part of the plant.

A breeder collects some powdery pollen from the tassels of one kind of popcorn. It gets sprinkled on the sticky silk of another variety. Later, kernels form on the corn cob. They're called hybrids. The hybrid popcorn has some traits from each of its parent plants. It may taste good like one of its parents and pop well like the other parent. By choosing which corn plants to breed together, scientists develop a new variety with the best traits from each parent plant.

Gourmet Popcorn

Is all the work of breeding new kinds of popcorn worth the trouble? You bet! One of the breeders' most famous success stories is gourmet popcorn. It's a super popper that explodes to 40 times the size of its kernels. Regular popcorn expands only about 30 times. Breeders are

The Pilgrims ate popcorn with cream for breakfast.





Some of the biggest poppers can pop 25 tons of corn a day.

always trying to do even better. Just like you, they want popcorn that tastes great, expands well and can be counted on to pop.

Popcorn on the Cob

Can you imagine eating popcorn on the cob? Some American Indians did just that. They were the first to start breeding different kinds of popcorn. When one of their varieties was roasted over the fire, its kernels popped right on the cob.

Regular popcorn was one of the foods that Indians brought to the Pilgrims at the first Thanksgiving in 1621. Soon it became popular with the settlers. Served with cream and sugar, it became the first puffed breakfast cereal.

Top Poppers

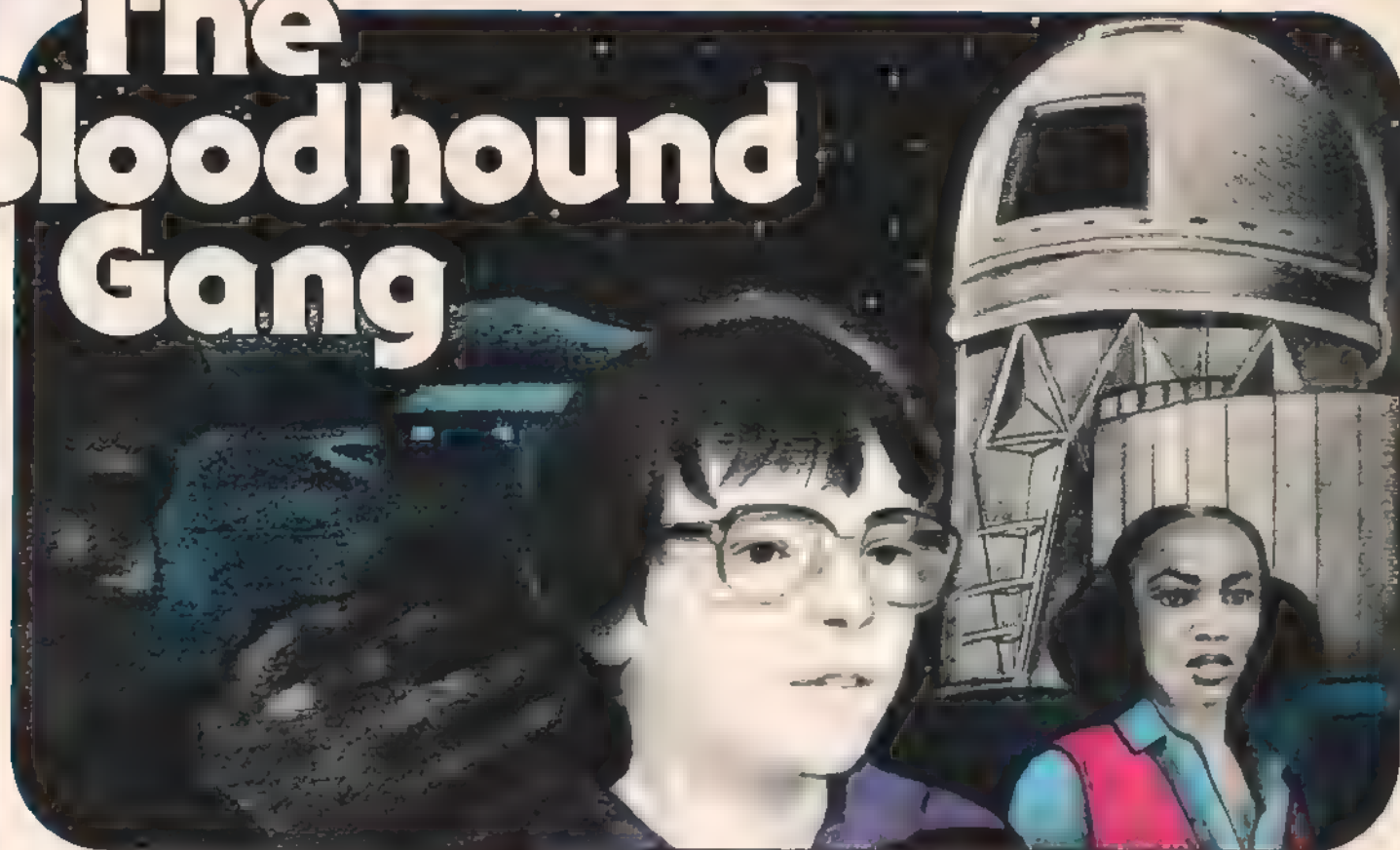
Today, the world's largest popcorn poppers are

found in factories. There, they pop the corn that goes into Cracker Jack, the caramel-covered corn treat. Each of these five poppers pops 25 tons of corn a day for five days a week.

On a smaller scale for home popping, a new invention is the hot air pumper. It pops corn by shooting super hot air past the spinning kernels. This is great for weight watchers. The pumper doesn't use oil, which would add calories to your popcorn.

But a pumper doesn't work equally well for all kinds of popcorn. When gourmet popcorn goes in, it gets blown right out again. For now, it looks like the best new popcorn and the best new popper don't go together. But things change fast in the popcorn world. Surely something new is bound to pop up!

The Bloodhound Gang



The Search for Planet X

Part One

by Lisa Eisenberg

Vikki and Skip drove away from Southwest Airport. Skip, the newest member of the Bloodhound Gang, looked out the window at the desert. "I'm lucky," he said to Vikki, "to have my first case in such a beautiful place."

Vikki and Skip were the only members of the Gang working on this case. Skip was being trained to replace Zack, whose family was soon moving to England. Mr. Bloodhound felt that the Mt. Red Observatory problem would be an easy case for Skip to break in on.

Vikki leaned forward to talk to Fred Fawley, the driver who had come to meet them. He was an assistant astronomer at Mt. Red. "How far away is the observatory?" she asked.

"About 35 miles south of here. But we'll be going up about 8,500 feet in altitude."

"You know, Mr. Fawley," said Vikki, "I've always wondered why there are so many astro-

nomical observatories here in the Southwest."

"Well, observatories are usually built where there's as little interference with observing as possible," he answered. "Weather, clouds, smog and extra light from big cities can all interfere with telescopes. That's why observatories are put in places with few people, in high places where the air is thin, clean and dry—like here."

In about half an hour, Mr. Fawley pulled into the observatory gates. The huge white dome of the building stood out against the blue sky. A woman met them at the front doors. "I'm Dr. Alma White," she said. "I run the Mt. Red Observatory." As a tall, gray-haired man appeared, she added hastily, "I mean, my colleague, Dr. Bertram Nobleman, and I run the observatory!"

"How do you do?" said Dr. Nobleman. His booming voice echoed in the front hall.

Dr. White sighed and pushed back her hair. "Now," she said, "come back to my office, and I'll fill you in about our problem here."

"Don't hesitate to call upon me as well," boomed Dr. Nobleman. Then he walked briskly away.

As Vikki and Skip started after Dr. White, they noticed a chubby man mopping the floor in the rear of the lobby. He winked at them.

"You'd better watch your step around here," he chuckled. "These stargazers are looneybirds. Imagine putting a white floor in a building surrounded by red dust!"

Vikki and Skip looked down. They saw that everyone who entered the observatory tracked in some red dust from the paths outside. "Cleaning these floors must keep you busy, uh..." Vikki began.

"Lester," said the man, smiling.

A Thief Steals the Spotlight

Skip and Vikki hurried to catch up to Dr. White. She was talking to a secretary just outside her office. "Any phone messages, Brad?" she asked.

The young man's face was vague and dreamy. "Uh, I don't think so," he answered.

Dr. White sighed and led Skip and Vikki into a cluttered little office. "I'm sorry it's such a mess here," she said. "My secretary left recently. Brad is just filling in temporarily. I don't think he takes the job very seriously."

She searched for a few minutes and found a folded newspaper. "Professor Moonglow writes an astrology column for the *Desert Daily*," she explained. "Normally, he just tells people what to expect each day."

Vikki said, "Like, 'You'll meet a new friend'?"

"Right," smiled Dr. White. "But last week, Moonglow wrote something different. Listen: 'Dear Moonchildren:

My vast knowledge has led to a great discovery. There is a new planet in our solar system. It's unknown even to the local astronomers who claim to know the ways of the heavens. I recently charted a change in the orbit of Uranus, which leads me to announce this find.'"

Dr. White threw the paper down on her desk. "There's more," she said. "And what worries us

is that some information in that article is based on accurate astronomical observation. It could have come from this observatory. Or it could have come from the astronomers at Mt. Maropal about 50 miles away. Their work is similar to ours."

"You mean, someone might be stealing your data?" asked Skip. "And selling it to this Moonglow?"

"That's what we believe. You see, most of our observing here is done through astronomical photography. Many telescopic images that we pick up are too dim to make out with the human eye. So we use cameras to take pictures of the images—and then we expose the film to light," she explained. "Then bright images appear on the film. We make records of what the images tell us and store the records in locked files. That information about Uranus's orbit was recorded only last week!"

"Did anyone break into the observatory?" asked Skip.

"No. So if the thief is stealing from us rather than Mt. Maropal, then someone has access to my keys—or Dr. Nobleman's."

"Is it possible that there actually is another planet in our solar system?" Vikki asked.

Before Dr. White could speak, Skip said, "Sure! They call it Planet X because X means ten. And, if it's there, it would be the tenth planet in our solar system."

"That's right," said Dr. White. "Follow me to our telescope, and I'll show you how we work to find it."

Looking for the Mystery Planet

Dr. White led Vikki and Skip into a huge round room. An enormous telescope was pointed at an angle through a slide-back opening in the ceiling. Fred Fawley stood at the top of some steps leading up to the telescope's viewer. Skip realized they were inside the domed room he had seen from the parking lot.

"Getting back to what you were saying before, Dr. White," Vikki said, "why do people believe there's a tenth planet out there?"

"Because of the way the other planets act. You see, Vikki, the sun's gravitational pull is the primary force in our solar system."

Suddenly, a sloshing noise interrupted ➤

them as Lester began mopping the white floor right behind them. Dr. White frowned and went on. "Gravity is a force that attracts two particles of matter to each other. Gravity is what holds objects to earth."

"And the sun's gravity," interrupted Skip, "holds the moon and the planets in their orbits around the sun."

"Correct," said Dr. Nobleman. "Now since the planets of the solar system exert gravitational pulls on one another, they affect each other's orbits."

Mr. Fawley was adjusting the telescope's turning mechanism. He spoke over his shoulder. "Astronomers have tracked significant wobbles in the orbits of Neptune and Uranus," he said. "These changes might be caused by the gravity of Planet X."

Dr. Nobleman joined Mr. Fawley on the steps and peered at the assistant's work. "Astronomers used to think that Pluto was affecting those planets," he said. "In fact, changes in the orbits of Uranus and Neptune first led to Pluto's discovery in 1930. But now we know that Pluto isn't large enough to cause such a strong pull as we've observed."

As the astronomers worked, Vikki pulled Skip over to the side of the room. "What are you observing about your first case?"

"I suppose any one of them could be swiping material," he said. "Maybe Mr. Fawley is bitter because he's only an assistant. Or maybe Dr. White and Dr. Nobleman are rivals for power. Maybe Lester is really a foreign spy."

"Maybe you should pipe down," hissed Vikki. "Here comes Fred Fawley."

The assistant astronomer drove Skip and Vikki to a small guest house nearby. He said. "It's the only place we have for visitors."

Baiting the Trap

The first thing Vikki did in her room was to call the *Daily Desert*. She was told that Professor Moonglow had been delivering the Planet X columns by messenger. No one knew where to reach him.

"What next?" Skip asked.

"Mr. Bloodhound suspected that Moonglow was working with someone inside this observatory or the other one," Vikki said. She pulled a

file folder out of her suitcase. "An astronomer friend of mine gave me some false data before we left. Our plan is to plant it in the file room. Then we hide..."

"And watch to see if anyone goes for the bait!"

After dinner in the observatory later that night, Mr. Fawley again drove them back to the guest house. There, she and Skip waited until 10:00. Then they slipped outside and started walking back.

Vikki and Skip quietly approached the observatory. Silently, they crept through the front lobby to the file room. Suddenly, footsteps tapped on the white linoleum floor.

"I'll see who it is," Vikki whispered. "You plant the data. I'll meet you inside the file room."

On tiptoe, Vikki hurried up the hall. She peeked into the telescope room. Mr. Fawley was looking through the eyepiece. He didn't even notice her.

With a sigh of relief, Vikki crept back toward the file room. She opened the door. Then her heart started to pound.

Skip's glasses lay on the floor near the window. Beside them was the master key he had brought to open the locked file. But Skip was nowhere to be seen!

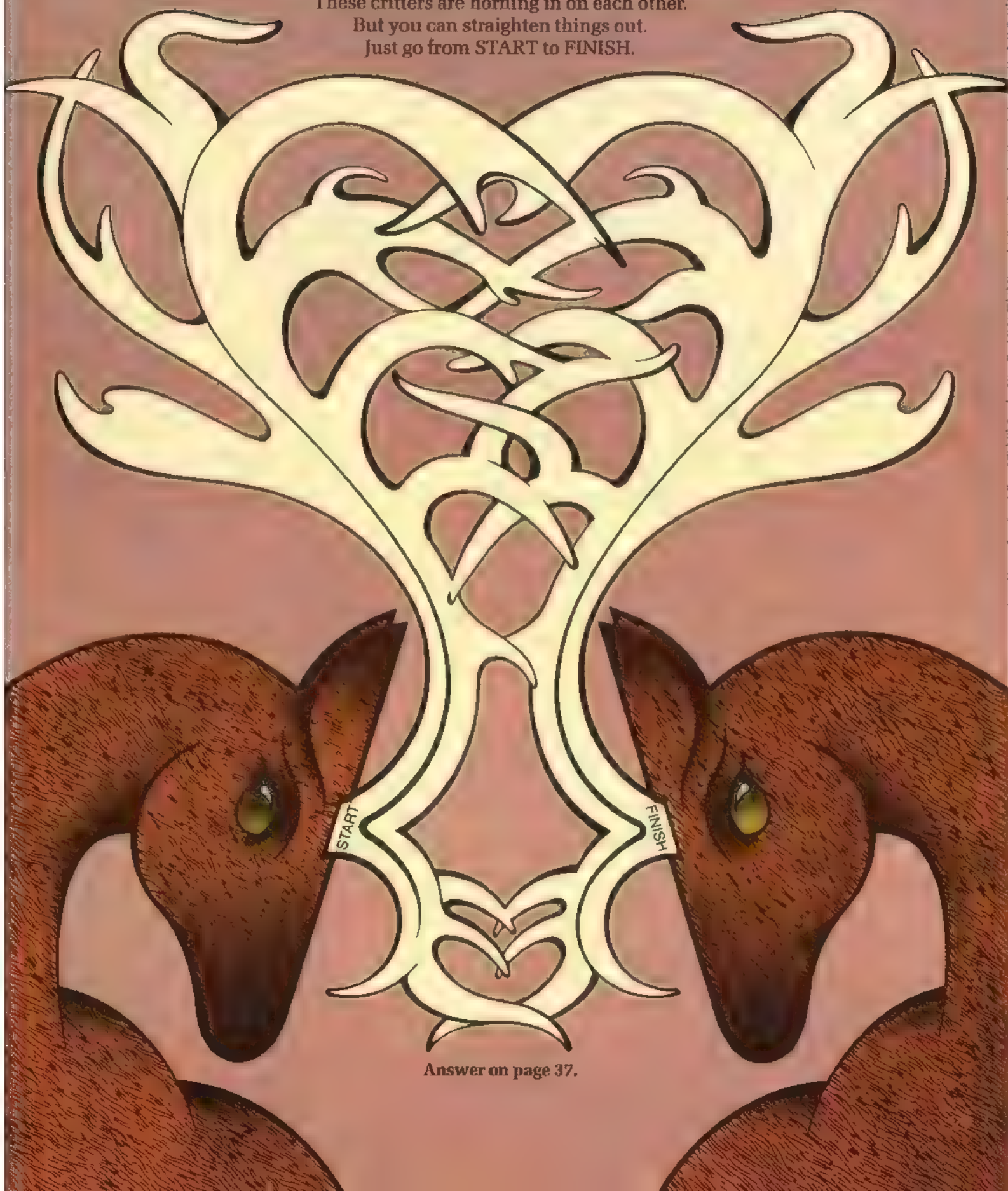
What happened to Skip?

To find out, read Part Two of "The Search for Planet X" in next month's issue of 3-2-1 CONTACT.



Antler Maze

These critters are horning in on each other.
But you can straighten things out.
Just go from START to FINISH.



Answer on page 37.

Easy Pickings

A HARVEST GAME

Autumn. Time for falling leaves and cool breezes. It's also time for the fall harvest. Crops are ripe and ready for picking. In this game for two, each player tries to win points by gathering food. The one with more points at the end of the game wins.

Get Ready

1. There are two paths for traveling around this board. Each player puts a coin at the START of one of the paths. One player puts a penny on the orange arrow and must stay between the orange lines. The other player uses a dime and must stay between the green lines. You will stay on the same color path during the whole game. Even so, players will cross each other's paths as they go.

2. Each player gets 10 checkers. One gets black checkers and other gets red.

How to Play

1. Choose who goes first and take turns. Use one of two dice to move around the board.

2. What do you do when you get to the end of your path? Just turn around and go back the other way. Keep moving back and forth along your path. As you go, you will harvest crops.

How to Get Points

1. When you land on a crop space, you have two choices. You can pick the food there and get the points. Or you can just keep going.

2. If you want to pick a food, cover the space with a checker.

3. If you land on a space where there already is a checker, nothing happens.

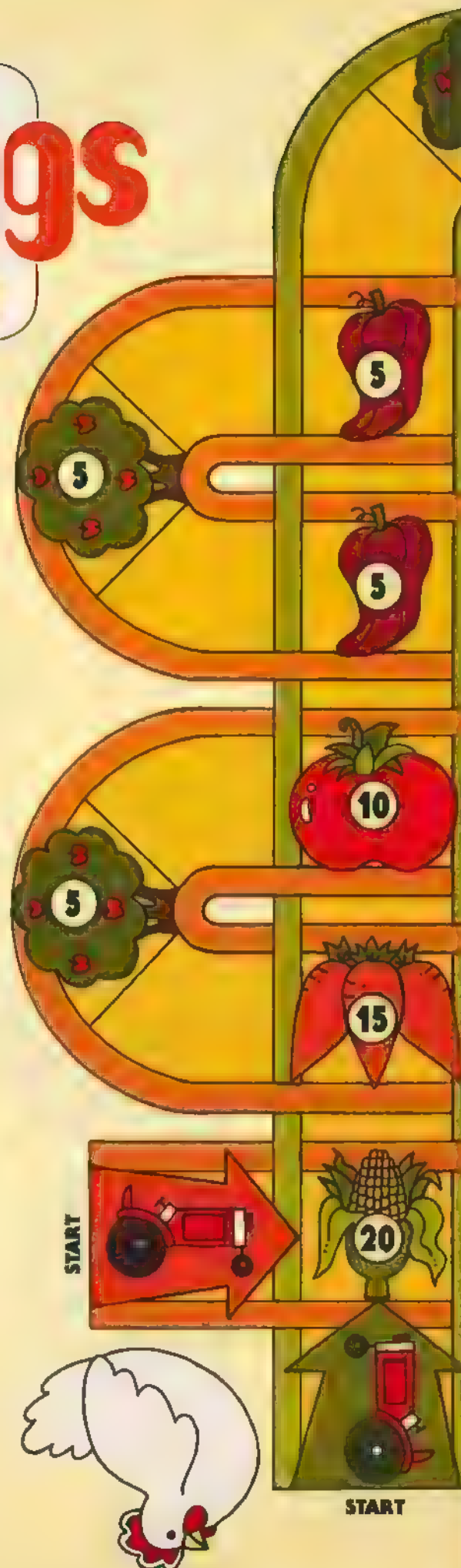
4. If you land exactly on the other player's coin, you can steal some points. Put one of your checkers on any of the spaces the other player has covered. Give the other player's checker back.

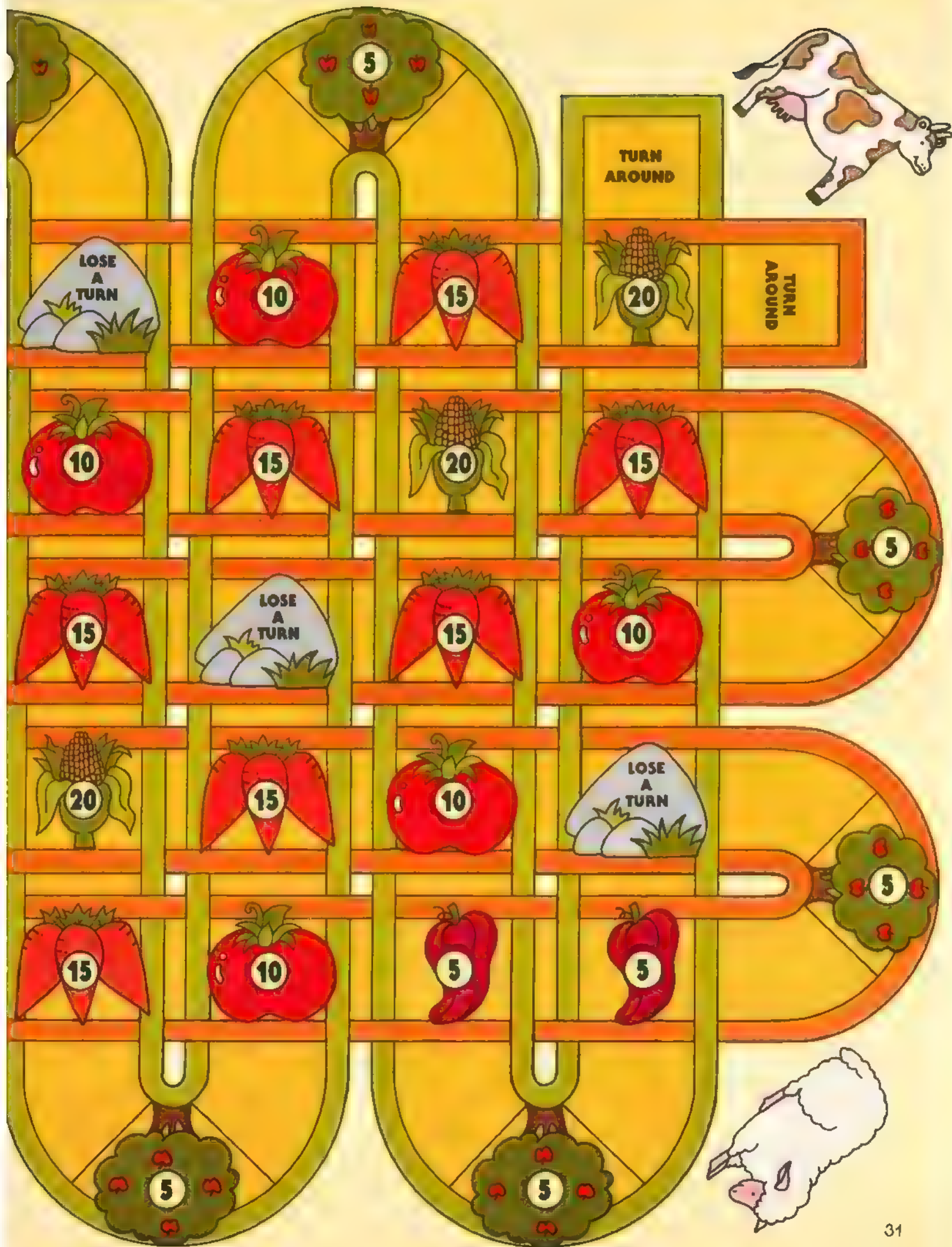
5. If you land on a space with a boulder, you lose one turn.

How to Win

1. The game ends when one player uses up all 10 checkers.

2. Now add up each player's points. Who has more points? That person is the winner!





MAIL

Contest Winners

A while back we asked you to create an experiment to send up in the shuttle. We got lots of far-out ideas. Here are some of them.

Question: Is the moon made of cheese? Find out by sending a mouse to the moon on the shuttle. We'll know the answer when the mouse returns. If the moon isn't made of cheese, the mouse will be skinny. If it is, the mouse will be plump!

Angelica Infozino, Massapeque, NY



A satellite comes out of the shuttle and takes space rocks. The space ship takes them back to earth and scientists study them.

Travis Escue, West Palm Beach, FL

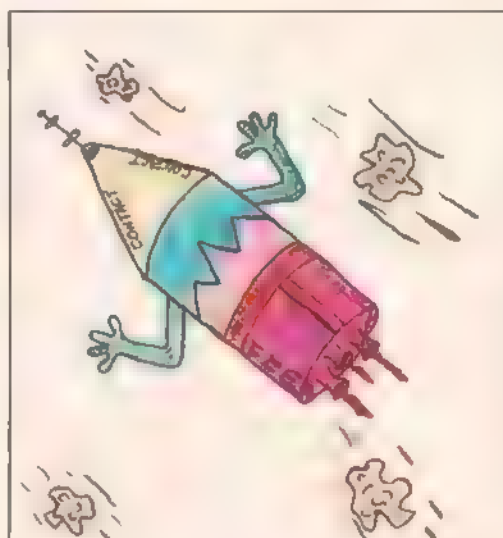
I would like to see if you could ride the rides at an amusement park. Such as the roller coaster, merry-go-round, etc. I would like to know if zero gravity affects any of the machinery or the weightlessness of everything would affect it.

Patricia A. Elias, Lakewood, CO

How frogs would react in space. You would have flies as well to see how the frogs would catch them.

Jonathan Stern, Beachwood, OH

I think it would be different to bring animals along on the space shuttle. With the United States' advanced technology in the coming centuries some people may be living in space stations. In those



Send up a special rocket in the space shuttle. This one has arms so it could grab meteors and you could look at them.

Allison Alerine, Garfield, NJ

stations they'll need animals to live off of. This experiment will show how animals react to being in space.

Corey Anderson, Hector, MN

I would like to send up a jar of blood and find out if the germs would shrink, expand, die or live better in zero gravity.

Brian Haskett, Katy, TX

I would like for NASA to let a bird fly around the shuttle for a few minutes to see if the bird could guide his or her way in space, like birds can on earth. I would expect for the bird to have a hard time. But you can never tell.

Joey Malone, Philadelphia, PA

Letters

Free for All

Dear 3-2-1-CONTACT,

You know those things in the magazine that you can send for that are free. Well, I was wondering if the old ones, like in June or August or any other months are still good. Please write back and tell me. Thank you.

Christy Hay
Albuquerque,
New Mexico

Dear Christy,

When we tell you to write away for something free, first we check that it's available. But we can't always be sure how many of a certain send-away are left. Sometimes you might be able to get something if you write for it three months after we tell you about it. And once in a while, a company runs out of a freebie even if you send for it the next day.

Unfortunately, we don't know what your chances are of getting what you want. You can find out, though. Just write to the address we give you. We hope that you'll get what you ask for. If not, try to get a different freebie next time.

Bloodhound Gang Mystery

Dear 3-2-1 CONTACT,

You wanted letters? Well, here's one now! I always seem to wonder why you don't have the Bloodhound Gang on Fridays on your show. You have it Mondays-Thursdays, but you never have the Bloodhounds on Friday. I'd like to know because I like the episodes from the Bloodhound Gang.

Nerissa Freeman
Richland, Washington

Dear Nerissa,

You're not the only one who would like to see the Bloodhound Gang on Friday. We would, too, as well as plenty of other kids. So, we decided to do something about the case of the missing Bloodhound Gang.

New episodes of the 3-2-1 CONTACT television show will be starting in a few weeks. This time, there will be a Bloodhound Gang mystery every day of the week. Including Friday!



Missing Bodies

Dear 3-2-1 CONTACT,

I get your book and I like it very much. It has interesting things in it. But there is one thing I don't like. You removed *Busy Bodies*. And *Busy Bodies* is one of my favorite things. I'm not mad or anything. I just want *Busy Bodies* back again.

Barbara Burkhardt

Dear Barbara,

Busy Bodies has appeared 21 times in the magazine. We have covered everything from the hair on your head to the nails on your toes. We felt it was time to try some different things.

So, for instance, we've done

stories about what happens when you sleep and how your memory works. We're busy planning other stories about you and your body, too. We hope you like them!

Phony Factoid

Dear 3-2-1 CONTACT,

In the February 1983 issue you said there are about 380 billion telephones in the world. My dad says that's impossible. I say so too. If that was true, everyone in the world would have at least 83 phones. There are lots of people in the world who have never even seen a phone. I think you mean 380 million phones. Please say you made a mistake in your little Oops column on page 37. Thank you. I'll be watching for it.

Alan Coopersmith
Reno, Nevada

Dear Alan,

Instead of just mentioning our error, we thought we'd explain what happened.

Your fancy math caught our mistake. Our figures would give everyone in the world 84 phones. Nobody talks that much! You're right—there are only 380 million phones in the world. And, believe it or not, almost half of them are in the United States!

We Want Mail!

Dear Readers,

We really love hearing from you. The questions, ideas and complaints we get help us make CONTACT a better magazine. So why not drop us a line? We can't answer every letter, but we do read them all. Send your mail to:

3-2-1 CONTACT:
Letters
P.O. Box 599
Ridgefield, N.J. 07657

Extra!

Don't close this magazine yet. You may be near the end of the issue. But there is plenty left to do! **Contact Extra** is a new feature. It's filled with puzzles, games and things to do. Watch for it every month.

Popcorn Sculpture

Of course popcorn tastes great. But is it art? It can be. All you need is some popcorn and a sticky food, like peanut butter or honey. Now start sticking those popcorn pieces together.

Start with something easy, like a ball of popcorn. Then work your way up to the fancy stuff. How about a popcorn ear of corn? Or a foot, with pop corn corns? When you finish, it's time for the best part. Eat your sculpture!

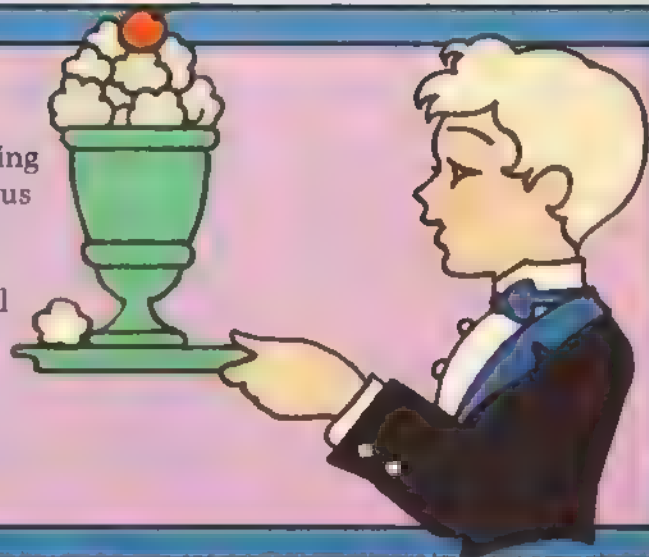


Tops in Pops!

Here is a special **CONTACT** challenge. We are looking for great popcorn recipes. And we think you can help us find them. Maybe you could make popcorn muffins. Or popcorn soup. The choice is up to you.

Send us a recipe for a popcorn treat. Be sure and tell us how to make it. We will print our favorite popcorn goodies in a future issue. Send your name, address and recipe to:

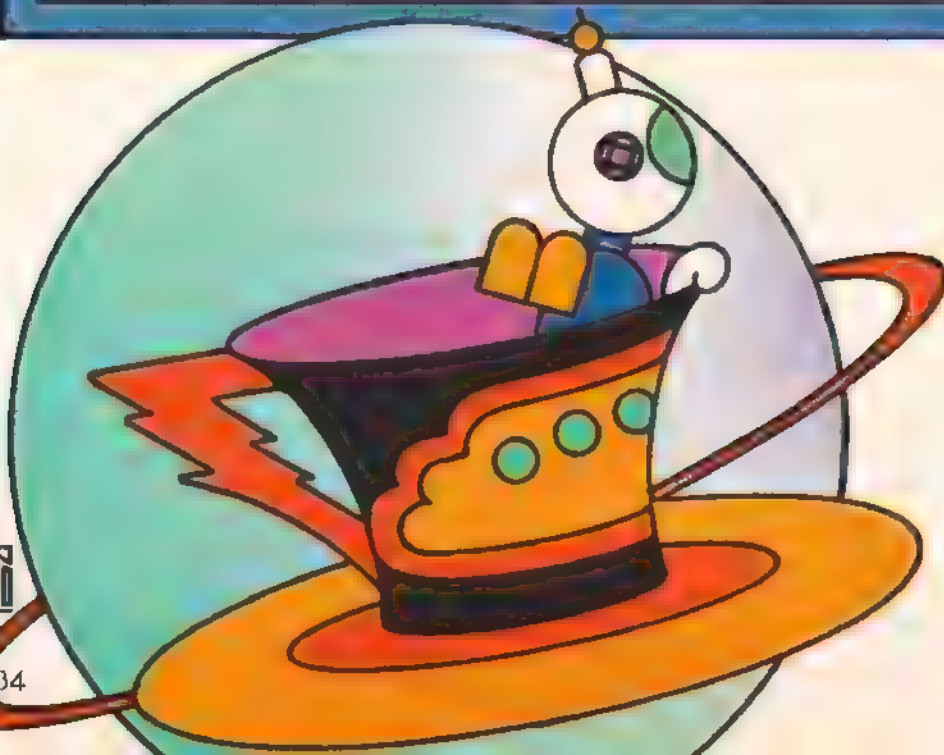
3-2-1 CONTACT: Popcorn
P.O. Box 599
Ridgefield, NJ 07657



Astro-Diet

Want to find out more about out-of-this-world foods that astronauts eat in space? NASA has information that's free for the asking. It's called "Food for Space Flight." This color booklet tells how the space food is prepared and eaten. Plus you can take a look at a real space shuttle menu.

Just send a letter asking for "Food for Space Flight" to:
Johnson Space Center
AP4
Houston, TX 77058





Presto!

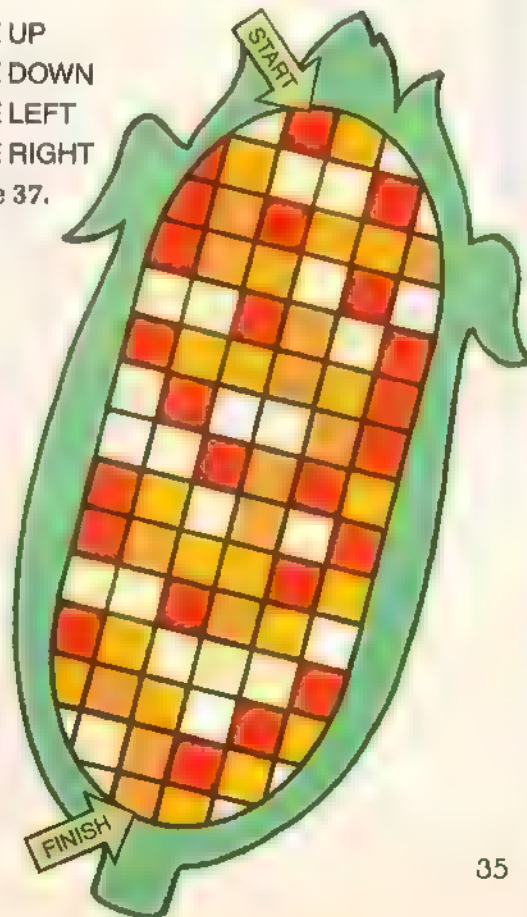
Get your rabbits and your hats ready. October 31 is National Magic Day. To celebrate, try a little magic of your own. You need a dollar bill and two paper clips. Fold the bill in thirds and attach the clips on opposite sides, as you see here. Quickly pull the ends of the bill apart. Before you can say, "That's a cheap trick," the clips are clipped—to each other.

Now Ear This!

This ear of Indian corn is also a maze. Start in the top row. Each kernel color lets you move one space in a different direction. Orange, for example, means move one space left. If you land on a red space, move one down. And so on. See if you can find a path that ends in the bottom row.

- ONE SPACE UP
- ONE SPACE DOWN
- ONE SPACE LEFT
- ONE SPACE RIGHT

Answer on page 37.



T	S	E	V	R	A	H
S	P	S	E	A	L	P
N	A	E	K	A	N	S
R	C	O	O	K	G	L
O	E	D	O	O	W	I
H	E	T	B	T	I	A
P	O	P	C	O	R	N

Ghost Hunt

O.K., folks! It's time to grab your pencils and start hunting! After you finish the word hunt, find the answer to our ghostly riddle. Just read the uncircled letters from left to right.

Word List:

Answers on page 37.

BOGS	NAILS	SNAKE
HARVEST	POPCORN	SPACE
HORN	SEAL	WOOD

What do ghosts eat for dinner?

Extra!

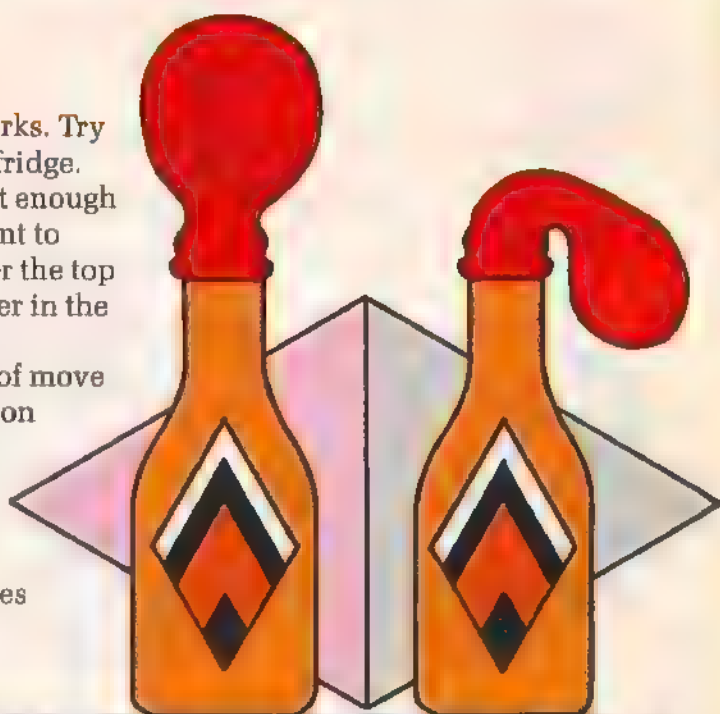
Cool It!

In *Any Questions?* you found out how a refrigerator works. Try this and find out more about what's going on inside your fridge.

Get two empty soda bottles and two balloons. Blow just enough air into the balloons to make them stand up. You don't want to stretch the rubber. Keeping the air in, put one balloon over the top of each bottle. Put one bottle in a warm place, and the other in the freezer. Check both after one hour.

When things cool, the tiny particles that they're made of move closer together. This causes the air in the refrigerator balloon to take up less space. So the balloon flops over. Cooling changes the particles in other things in your fridge, too. Creamy butter turns hard as a rock. A piece of bread that is cooled feels stiffer than one at room temperature.

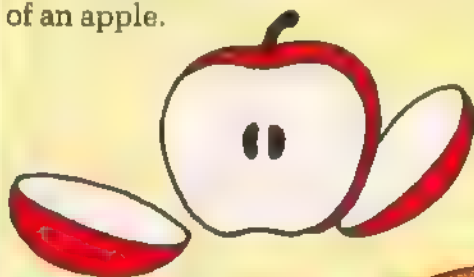
After you finish this experiment, leave the balloon bottles together in a warm place. Again, wait an hour. Notice any more changes?



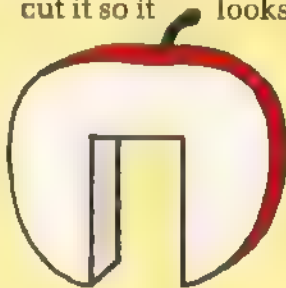
Six Easy Pieces

Here's a toothpick trick with a twist. Try this puzzle. After you finish you can eat the results.

Cut a one-inch slice down the middle of an apple.



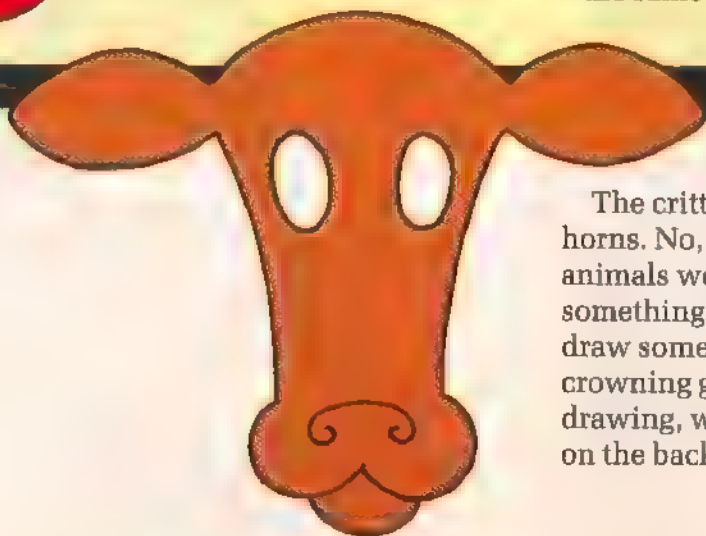
Take the center piece and cut it so it looks like this.



Now, put in the toothpicks this way.

The trick is to divide the apple into six parts with just two cuts of the knife. Each part should be about the same size and should have a toothpick in it.

Answer on page 37.



3-2-1 Contest

The critter you see here is missing something: horns. No, not the kind that beep. The kind that animals wear on their heads. It's up to you to do something about it. Copy or trace the head. Then draw some horns or antlers to go with it. Our favorite crowning glories will get T-shirts. Send your drawing, with your name, address and T-shirt size on the back, to:

3-2-1 Contest: Horns
P.O. Box 599
Ridgefield, NJ 07657

Did It!

Antler Maze (page 29)



Ghost Hunt (page 35)

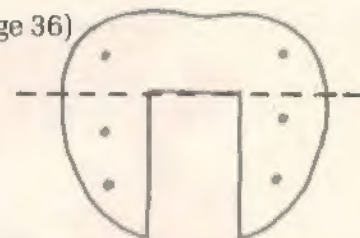


Now Ear This! (page 35)

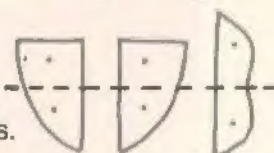


Six Easy Pieces (page 36)

First, cut the apple across the top like this.



Place the three slices side-by-side like this. Now make the cut down the middle and you should have six pieces.



Thank You! Thanks to student intern Joanna Harrael for help in preparing this month's issue.

Next Month!

Here's a sample of what you'll find in the next issue of 3-2-1 CONTACT:

Future Flights

Read about a new kind of flying machine that you might travel in some day.

Boomerangs

Find out how they work and build one of your own.

Bloodhound Gang

Vikki, Ricardo and Skip solve this month's mystery.

Plus Factoids, a Poster, Letters and Much More!

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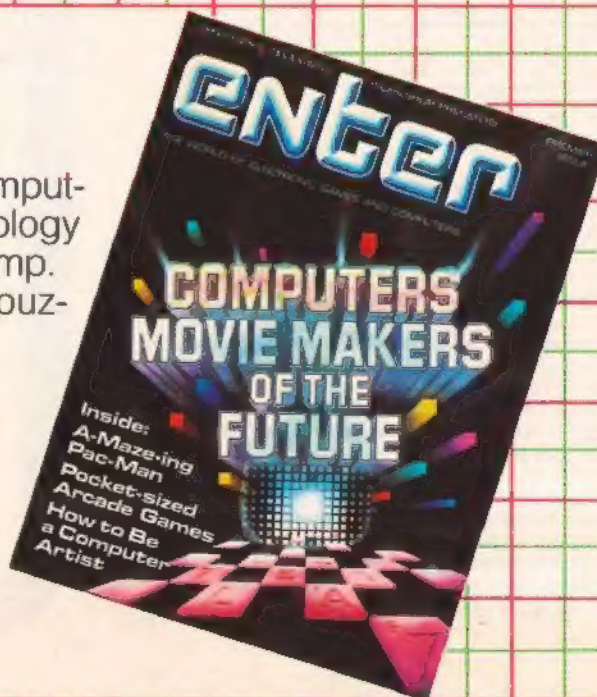
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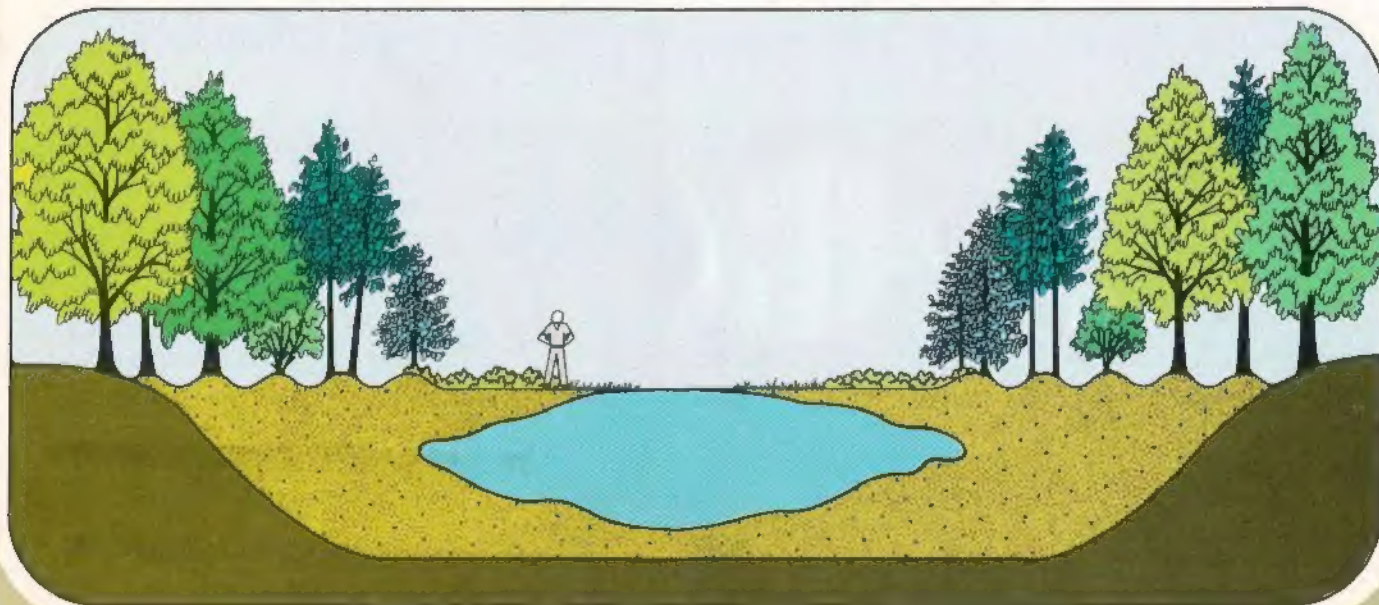
Earthfacts: Bogs

Each month CONTACT will bring you another *Earth Works*. Save these pages in a notebook. Soon you will have your own guide to the wonders of the planet earth.

EarthWorks

- Cranberry bogs are fun to look at—especially when they are flooded for harvest. These special bogs are made by people. But *natural* bogs are different. They are deep, cold ponds. Natural bogs were scooped out of the ground thousands of years ago by chunks of moving ice.
- A natural bog looks like a pond surrounded by trees, bushes and grass. But the grassy area around the edge isn't land. It's a thin layer of plants. They float on the bog's water.
- Bog water has more acid than many other kinds of water. So it is low in nutrients that many plants and animals need to live. That's why many things can't live in bogs. Not even many fish live in bog water.
- Some plants do manage to live in bogs. That's because they have special ways to get the nutrients the bog water and soil don't provide. Bog plants like the Venus flytrap, pitcher plant and sundew trap insects. Then they get the nutrients from the remains of the bugs.
- Another plant that does well in a bog's acid soil and water is the wild cranberry. Early settlers found them growing in natural bogs on the east coast of North America. Indians that lived there showed the settlers how to plant them.
- Today, cranberry bogs are made from natural bogs. First the water of a natural bog is drained and the plants are pulled up. The bog is flattened. Then a thin layer of sand is spread. Finally, the cranberries are planted. Cranberries will only grow in the special acid soil of a bog.
- When natural bog plants die, they stay on the bog's bottom. They build up and form a thick brown material called peat. Peat can be chopped out of bogs, dried, and used for fuel.
- Bogs are often found in isolated, mysterious-looking places. And sometimes people's imaginations run wild. In southern New Jersey, people told of a strange creature, the Jersey Devil. It is supposed to haunt the bogs and pine forests there. Some say it has a tail, wings and the body of a goat. Most people don't believe these stories. But some of them still stay away from the bogs on dark, misty nights.

Below: Natural bogs fill up with dead plant material called peat. The bog continues to shrink as plants fill in toward the center, making a mat over part of the water. You can see why walking on parts of a bog that *seem* solid could be dangerous. If you walk too far, you could sink through.



EarthWorks



Dogs

Cranberries grow in special fields called bogs. When the berries are growing, the bogs are kept dry. But at this time of year, harvest time, flooded cranberry bogs are a familiar sight. After the bog is flooded, a machine shakes the cranberries off their vines. Then they float to the surface of the water. There the red sea of berries is scooped up for packing. For more on cranberry bogs and others, turn to page 39.

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